When reading the results tables, please keep in mind several factors. First, remember the importance of relating the sample sizes for a given data element to the outcome. For instance, a vendor that only finds three of six possible data points (50% accuracy) does not necessarily mean that a larger sample from an entire city roadway system would also yield the same results. Second, remember that any difference between manual and mobile data could be due to errors in the manual data as well as the mobile data. While the manual data were collected and reported carefully, they are certainly not perfect.

A critical step in the data analysis was matching each manual observation to the corresponding observation in a vendor's data set. This was accomplished by means of an automated spreadsheet routine that computed the distance between each feature reported manually and each feature of that type in each vendor's data set, based on the latitude and longitude reported for each point. The criteria for declaring that there was a match between a manual observation and a vendor observation were:

- That the distance between the two points was 200 feet or less; and
- That the matched point was the closest of that type in the vendor data set.

Every match was confirmed by a manual check of the results file by a member of the project team. Most matched points were obvious and there were very few close calls. Where average difference and percent difference are calculated in the following sections, the equations are noted below. The average difference was determined by:

$$\sum_{i=1}^{n} \frac{\left|(m_i - v_i)\right|}{n} \tag{6.1}$$

The percent difference was determined by:

$$\frac{\sum_{i=1}^{n} \frac{\left|(m_i - v_i)\right|}{v_i}}{n} * 100 \tag{6.2}$$

where *m* and *v* are the manual and vendor collected data, respectively.

6.4.1. Attenuators

Attenuators are intended to redirect traffic and/or absorb a portion of the kinetic energy caused by an impacting vehicle. Vendors were asked to collect a point location (latitude and longitude) of every attenuator on the right side of the road in the driving direction only. The attenuator was defined as an end treatment or attenuator and given a classification of functioning or non-functioning.

Table 6.5 summarizes the data from manual and vendor data collection methods. As an example, statistics for Geo-3D were calculated in the following manner:

- Of the 6 **Total** manually collected attenuators, Geo-3D correctly identified 5 data points, for 83% accuracy.
- Of the 5 total attenuators located by Geo-3D,